

DRAFT

65016

Large Glass Object
21 grams

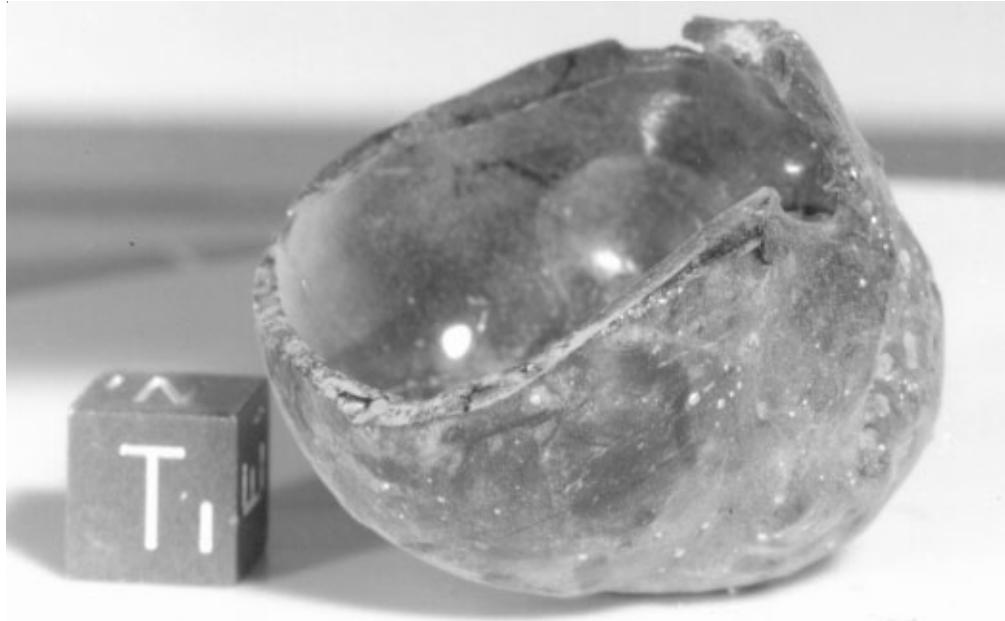


Figure 1: Photo of large hollow glass object, 65016. Cube is 1 cm. NASA S72-39399.

Introduction

65016 is a hollow, broken sphere or glass bubble (figure 1). It is about 3 – 4 cm in size. The glass surface is smooth and without zap pits.

Petrography

Schaal et al. (1979) and Ryder and Norman (1980) provide rough descriptions. Glass object 65016 is all glass except where some microlites are growing adjacent to nucleation centers around included feldspar (figure 2). It has a smooth outer surface lacking micrometeorite pits.

Chemistry

Ganapathy et al. (1974), Morris et al. (1986) and See et al. (1986) determined the composition (table 1) which is rather like local soil (figure 3). Hertogen et al. (1977) assign 65016, 60095 and the glass coat of 64455 to meteorite group 5H and conclude that these

fresh glasses probably represent impact melt produced by South Ray Crater.

Other Studies

Uhlmann et al. (1974, 1977, 1978) and Klein and Uhlmann (1976) did experiments and calculations on glass from 65016 and synthetic analog to calculate the cooling rate required to avoid recrystallization (2×10^3 deg C/min). They determined the liquidus temperature as 1360 deg C.

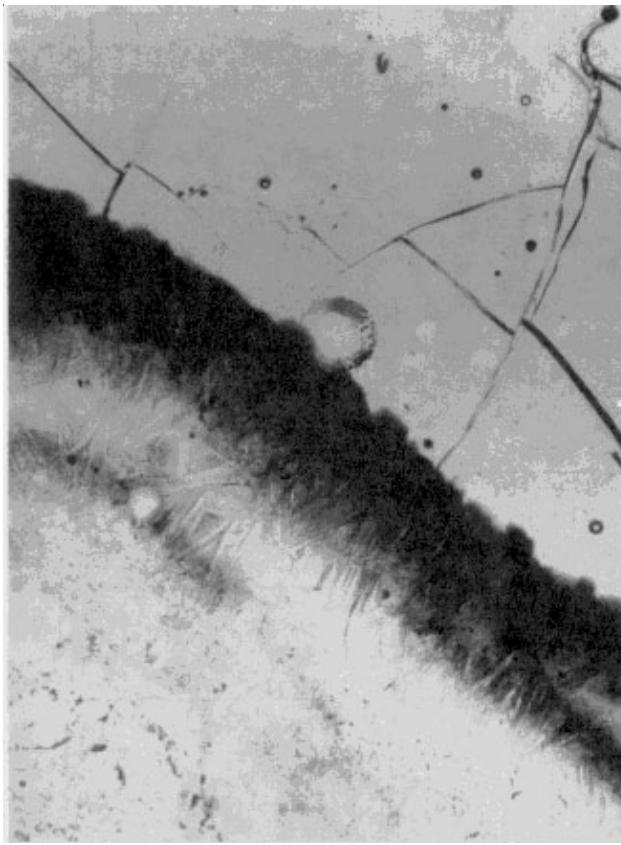


Figure 2: Thin section photo of glass at boundary with anorthosite inclusion showing devitrification of glass. Field of view 2 mm. (from Ryder and Norman 1980)

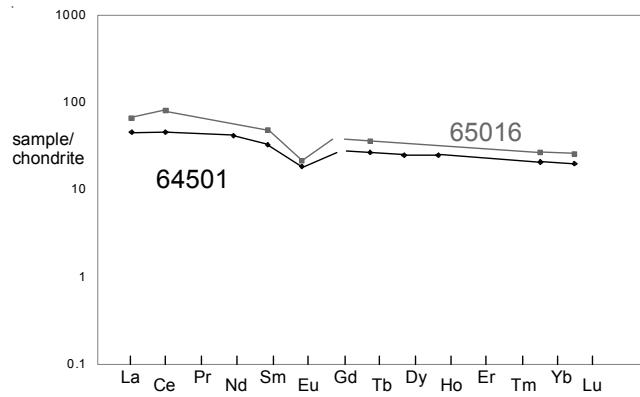


Figure 3: Normalized rare-earth-element pattern for 65016 glass object (Morris et al. 1986) and for soil 64501 (Papike et al. 1982).

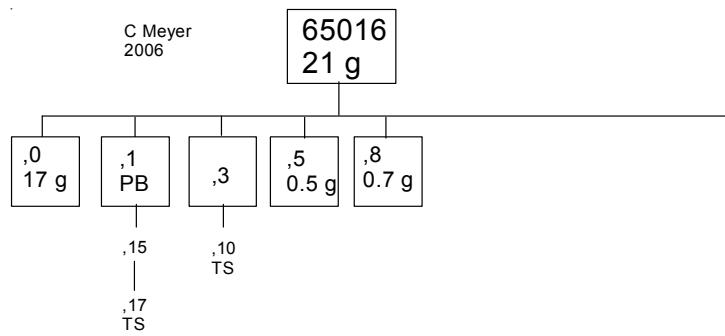


Table 1. Chemical composition of 65016.

reference	Uhlmann 77	Ganapathy74	Morris86
weight		See 86	
SiO ₂ %	44.2	44.7	(d)
TiO ₂	0.6	0.48	(d)
Al ₂ O ₃	26.5	26.56	(d)
FeO	5.5	5.06	(d)
MnO			
MgO	7.3	7.15	(d)
CaO	15.3	15.35	(d)
Na ₂ O	0.4	0.26	(d)
K ₂ O	0.1	0.08	(d)
P ₂ O ₅			
S %			
sum			
Sc ppm		6.77	(c)
V			
Cr		745	(c)
Co		43	(c)
Ni	532	(b) 566	(c)
Cu			
Zn	0.52	(b)	
Ga			
Ge ppb	225	(b)	
As			
Se	96	(b)	
Rb	1.44	(b)	
Sr			
Y			
Zr			
Nb			
Mo			
Ru			
Rh			
Pd ppb			
Ag ppb	0.59	(b)	
Cd ppb	1.5	(b)	
In ppb			
Sn ppb			
Sb ppb	1.66	(b)	
Te ppb	12.8	(b)	
Cs ppm	0.062	(b)	
Ba		146	(c)
La		15.6	(c)
Ce		48.9	(c)
Pr			
Nd			
Sm		7.16	(c)
Eu		1.21	(c)
Gd			
Tb		1.32	(c)
Dy			
Ho			
Er			
Tm			
Yb		4.4	(c)
Lu		0.64	(c)
Hf		4.6	(c)
Ta		0.56	(c)
W ppb			
Re ppb	2.29	(b)	
Os ppb			
Ir ppb	26.3	(b)	
Pt ppb			
Au ppb	7.19	(b)	
Th ppm		2.9	(c)
U ppm	0.65	(b) 0.54	(c)

technique: (a) emp, (b) RNAA, (c) INAA